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August 22, 2002

Ms. Marlene H. Dortch
Secretary
Federal Communications Commission
445 12th Street, SW, Room TWB-204
Washington, DC 20554

Re:
In the Matter of Review of Section 251 Unbundling Obligations of Incumbent Local Exchange Carriers and Implementation of the Local Competition Provisions in the Local Telecommunications Act of 1996, CC Docket Nos. 01-338; 96-98; 98-147

In the Matter of Appropriate Framework for Broadband Access to the Internet Over Wireline Facilities, CC Docket Nos. 02-33; 95-20; 98-10

Dear Ms. Dortch:

Yesterday, I met with Dan Gonzalez, Commissioner Martin's Legal Adviser, to discuss issues related to the aforementioned proceedings. During the course of that discussion, I distributed the attached document to Mr. Gonzalez and discussed with him AT&T's Electronic Loop provisioning proposal. The positions expressed in the meeting were consistent with those contained in the Comments Reply Comments and ex parte filings previously made in the aforementioned dockets. One electronic copy of this Notice is being submitted for each of the referenced proceedings in accordance with the Commission's rules.

Sincerely,

Robert W. Quinn Jr.

Enclosure
cc: Dan Gonzalez

Electronic Loop Provisioning
(ELP)

Enabling The Competitive All-Service Network Of The Future

August 7, 2002

OVERVIEW

>>> **Introduction**

- > Engineering and Policy Goals
- > Current Architecture and Roadblocks

>>> **Network Architecture and Technology**

- > ELP Defined
- > Impact on Local Network
- > ELP Non-Alternatives

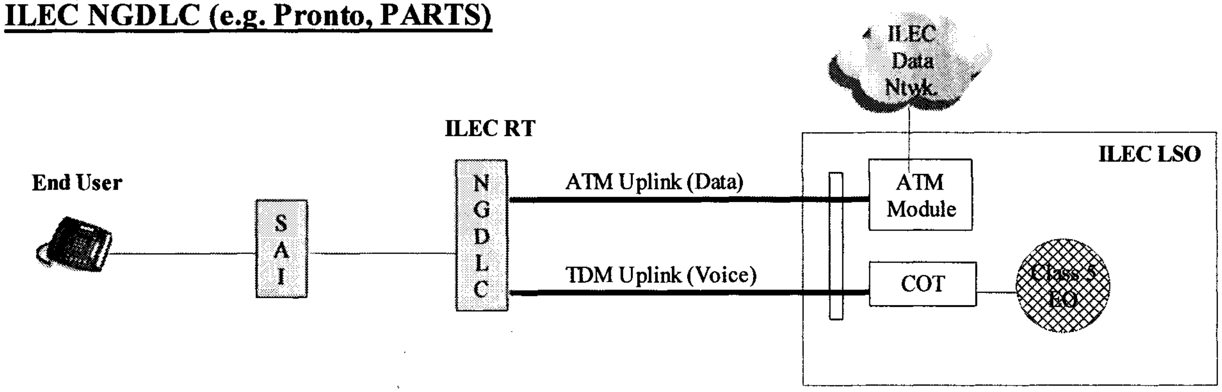
>>> **Investments and costs**

>>> **Other**

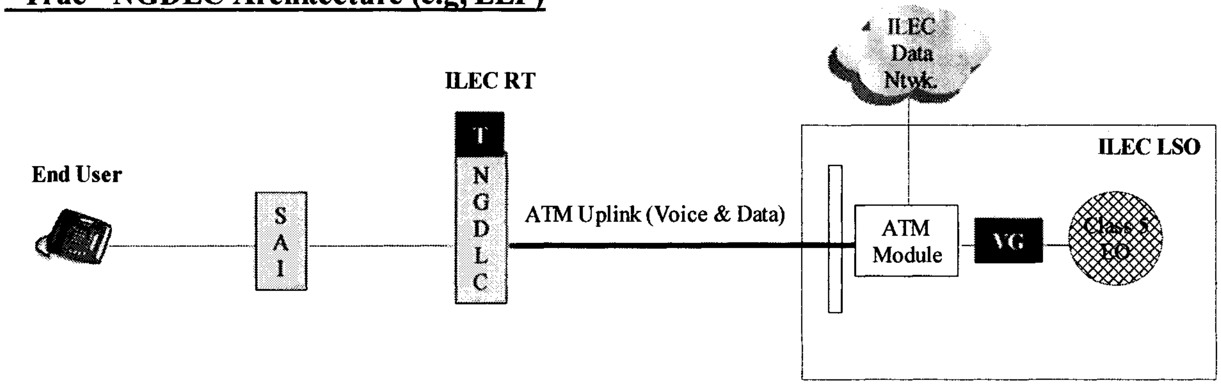
- > Legal Authority
- > OSS
- > RBOC Assertions
- > ELP Benefits

ILEC NGDLC vs. "True" NGDLC

ILEC NGDLC (e.g. Pronto, PARTS)



"True" NGDLC Architecture (e.g, ELP)



Key

Copper Districution
Fiber Feeder
Fiber Distribution Frame (FDF)
TNGDLC NGDLC with Voice Packet Processor (VPP)
VG Voice Gateway

INTRODUCTION

ENGINEERING GOALS

>>> **Want all lines to be efficiently unbundlable**

> For both voice and data

> Without expensive/unreliable transfer/hot cut process

>>> **Want all lines to efficiently support DSL**

> Ability/speed depends on maximum copper distance

> Without expensive/unreliable loop transfer process

>>> **Want all lines to support secure, highly reliable, converged high bandwidth (generally packet-based) network architecture of the future**

> Unified loop network for voice and data

> Integrated with efficient switching and interoffice networks

POLICY GOALS

>>> **Facilitate Maximal Level Of Competition**

> For both voice and data

> Making most efficient use of network resources

> Encourage service innovation by all carriers

>>> **Make Broadband Available To All Customers From Many Service Providers**

> Without regard to location

> Scalable in capacity

> At low cost in marketing and provisioning

> Without ILEC being given undue preference to customer access

>>> **Improve Network Infrastructure and Promote Network Evolution**

> In both ILEC and CLEC networks

> Transition from "old" analog circuit networks to "new" digital packet networks

>>> **Reinvigorate Telecom Investment**

AT&T's PROPOSAL

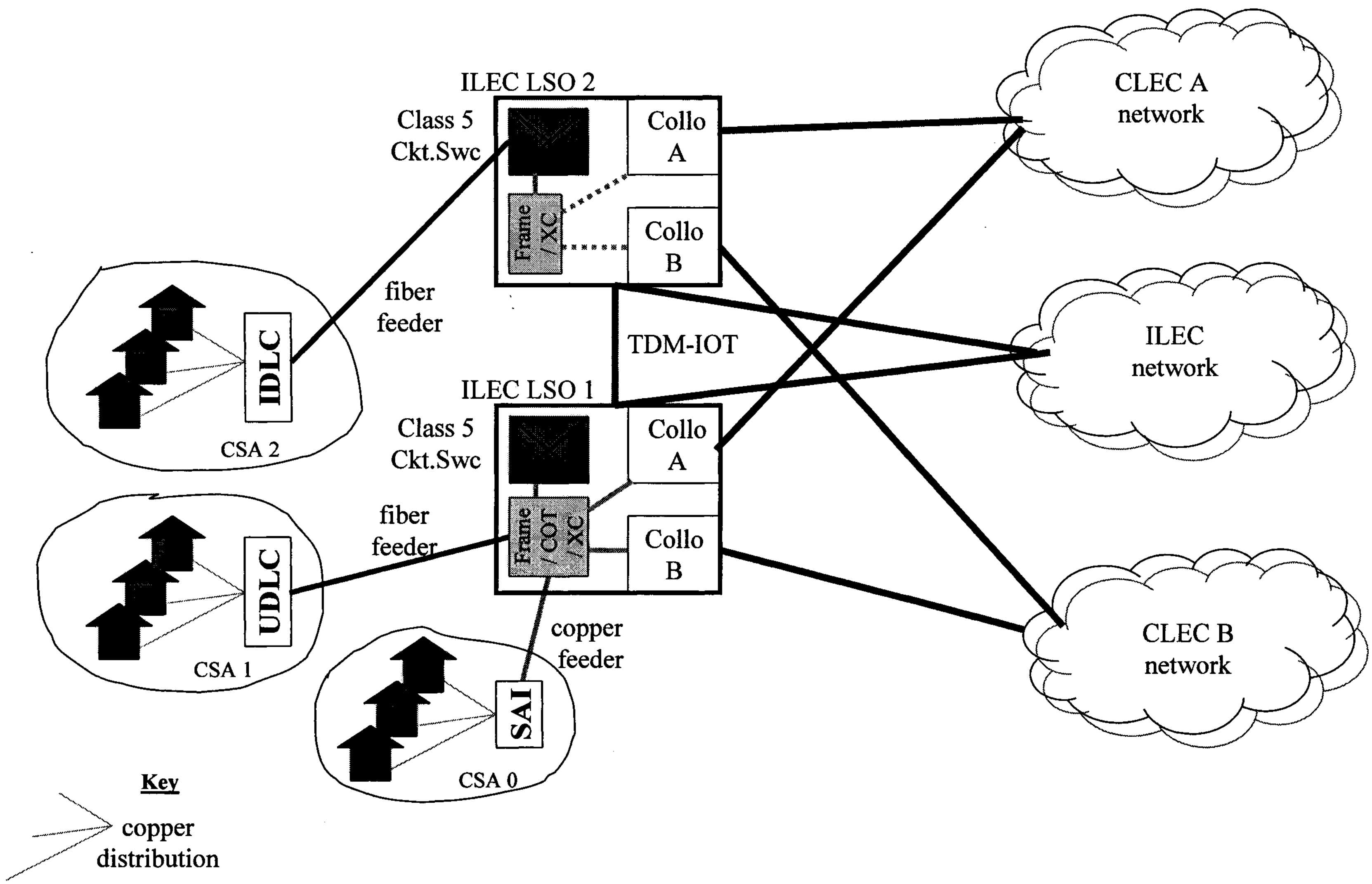
>>> An efficient, technically feasible means of accessing voice-grade loops

>>> Uses currently available technology

>>> Other possibilities may exist, and AT&T would consider any alternative that can meet the same objectives promptly

>>> Some form of electronic loop provisioning is a necessary pre-requisite before eliminating unbundled switching or transport for customers served by voice-grade-loops

CURRENT CARRIER SERVING AREA (CSA) ARCHITECTURE



CURRENT ROADBLOCKS

>>> **Copper feeder technology**

- > Length and quality of copper loops
- > Needs hot cuts/loop transfers

>>> **UDLC technology**

- > Does not support DSL and provides inferior v.90 analog modem performance
- > Needs hot cuts/loop transfers

>>> **IDLC/Pronto technology**

- > Not efficiently/economically unbundlable
- > Inefficient duplication and use of network resources

>>> **Current loop networks are "hardwired"**

ELP TECHNOLOGY ADVANTAGES

Criteria	Cu < 18 kft.	Cu > 18 kft.	UDLC	IDLC/ Pronto	ELP
Support DSL?	$	X	X	+	+
Support V/D Unbundling?	$ / $	$ / X	$ / X	X	+
Support Convergence?	X	X	X	X	+

Key

X Not feasible
$ Feasible only with expensive hot cut/loop transfer/collocation
\+ Feasible

Note

In addition, all of the current loop technologies are subject to single points of failure in the feeder network or at their serving central office.

NETWORK ARCHITECTURE
&
TECHNOLOGY

ELP DEFINED

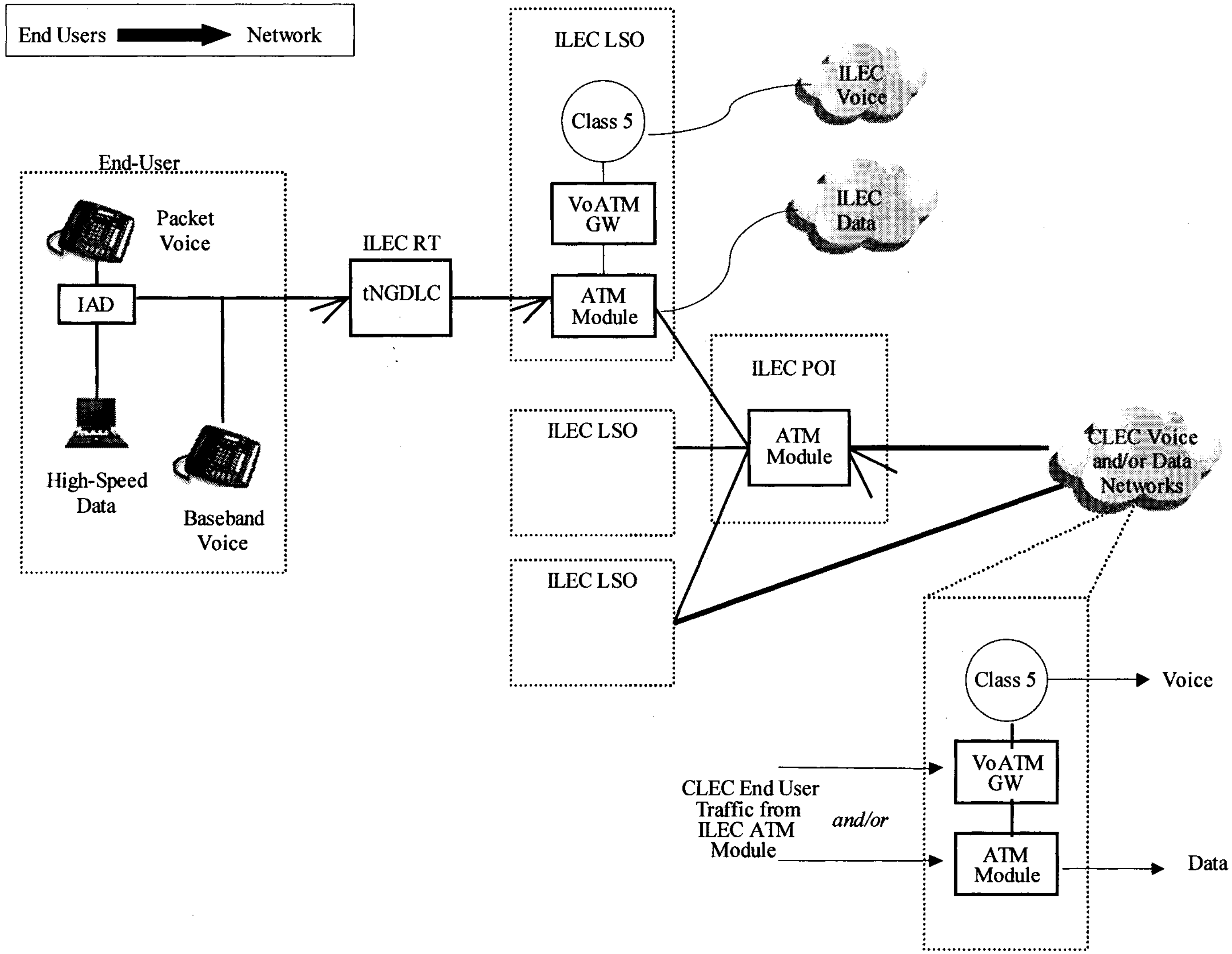
>>> ELP redefines the end-user to wire center connection from one that is physically hardwired to one that is software defined.

>>> ELP via "true" NGDLC (tNGDLC) architecture is achieved via upgrading and deploying new equipment in the local network that supports packet technology—with ATM being the best example.

>>> ATM transport technology permits software defined relationships (e.g., Permanent Virtual Circuits or PVCs) between end-users and LECs.

>>> ELP supports functionality analogous to 1980s FGD Equal Access and automated LD PIC processes for migrating customers among LD carriers efficiently and cost effectively--irrespective of migration volumes.

GENERAL ELP NETWORK ARCHITECTURE



IMPACT ON LOCAL NETWORK

ELP via tNGDLC Architecture Upgrades Existing Local Networks

>>> **Outside Loop Plant:**

> ***"true" NGDLC (tNGDLC) equipment*** packetizes all end-user communications and connects copper wires serving the end user premises with fiber feeder facilities routed to the central office.

>>> **Central Office:**

> all subtending tNGDLC equipment is connected to an ***ATM module*** -- to which all LECs interconnect for access to the "loops" serving retail customers. (This ATM module is analogous to CO OCD equipment being deployed by the ILECs in their NGDLC architectures.) Under ELP, the ATM module functions as an "electronic" MDF.

> **VoATM gateways** to translate traffic between the packet-based ELP architecture and a LEC's Class 5 circuit switch.

IMPACT ON LOCAL NETWORK

>>> **Other than these three upgrades, the ELP architecture preserves most existing local network investment:**

> **CPE** remains unchanged for voice services. Compatible CPE needed for advanced services (e.g. high-speed data, derived voice lines, etc.)

> **Distribution facilities** (e.g. copper) from NID to RT remain unchanged

> **Fiber feeder facilities**, between RT and CO, remain unchanged (copper feeders upgraded to fiber)

>>> **ELP is incremental to current NGDLC (and many other legacy DLC architectures) being deployed by the ILECs**

>>> **For short loops (e.g. non-DLC loops located close to the CO), ELP tNGDLC would likely be deployed in the ILEC central office.**

ELP IMPLEMENTATION SCENARIOS

Incremental Needs

Loop Topology	Outside Plant (OSP)	Central Office Equipment (COE)
Fiber-Fed IDLC/UDLC (DSL Ready)	Voice Packet Processor (VPP)	ATM Module* VoATM Gateway
Non-Fiber Fed IDLC/UDLC (Not DSL Ready)	ADSL-Capable tNGDLC w/ VPP Fiber Feeder Between RT & CO	ATM Module VoATM Gateway
All-Copper Loops (Non-DLC Loops)		ADSL-Capable tNGDLC w/ VPP** ATM Module VoATM Gateway

* ILEC NGDLC Architectures (e.g., SBC's Project Pronto and Verizon's PARTS require the deployment of ATM Modules at their LSOs already).

** tNGDLC could be placed in the OSP (e.g., at a new fiber fed RT site) in order to support "faster" DSL services.

VOICE QUALITY PARITY

ELP can be engineered by the ILECs to mitigate QoS concerns and to manage feeder facilities fairly and efficiently:

AT&T Labs Evaluation Voiceband modem, facsimile and voice quality performance on VoATM loops found to be on par with existing/legacy loop technologies when using G.711 (PCM) codecs and when the network can guarantee QoS to the conforming ATM cell flow.

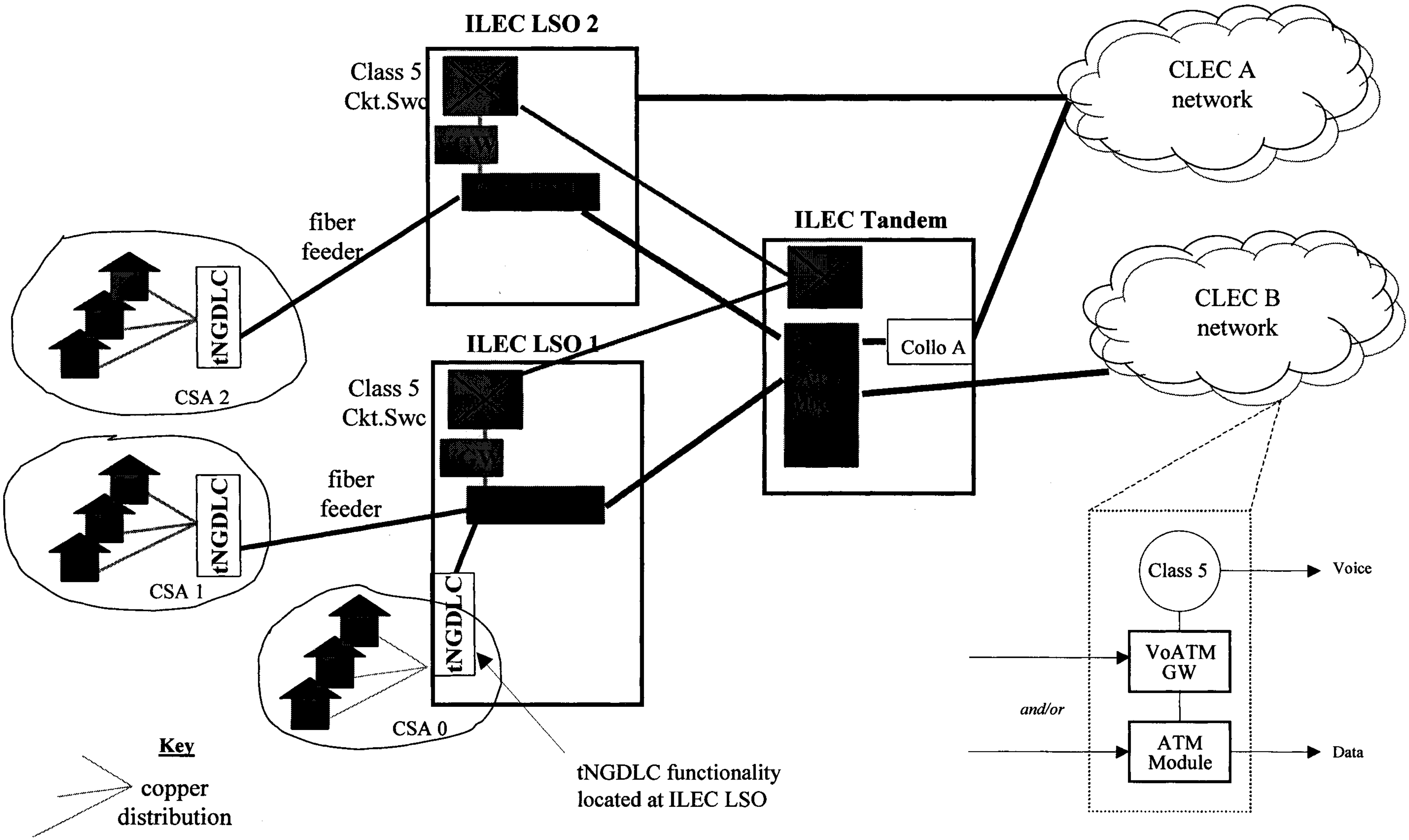
Service Class Support of VBR -rt and VBR –nrt ATM service classes by the ATM network enables QoS for delay-sensitive NB voice traffic and loss-sensitive BB data traffic, respectively.

VPC Service provider would request an appropriately sized Virtual Path Connection. Engineer voice VPC bandwidth to meet CLEC call blocking performance requirements. Engineer data VPC bandwidth to allow data performance to meet CLEC requirements. CLEC determines oversubscription ratio→ grade of service.

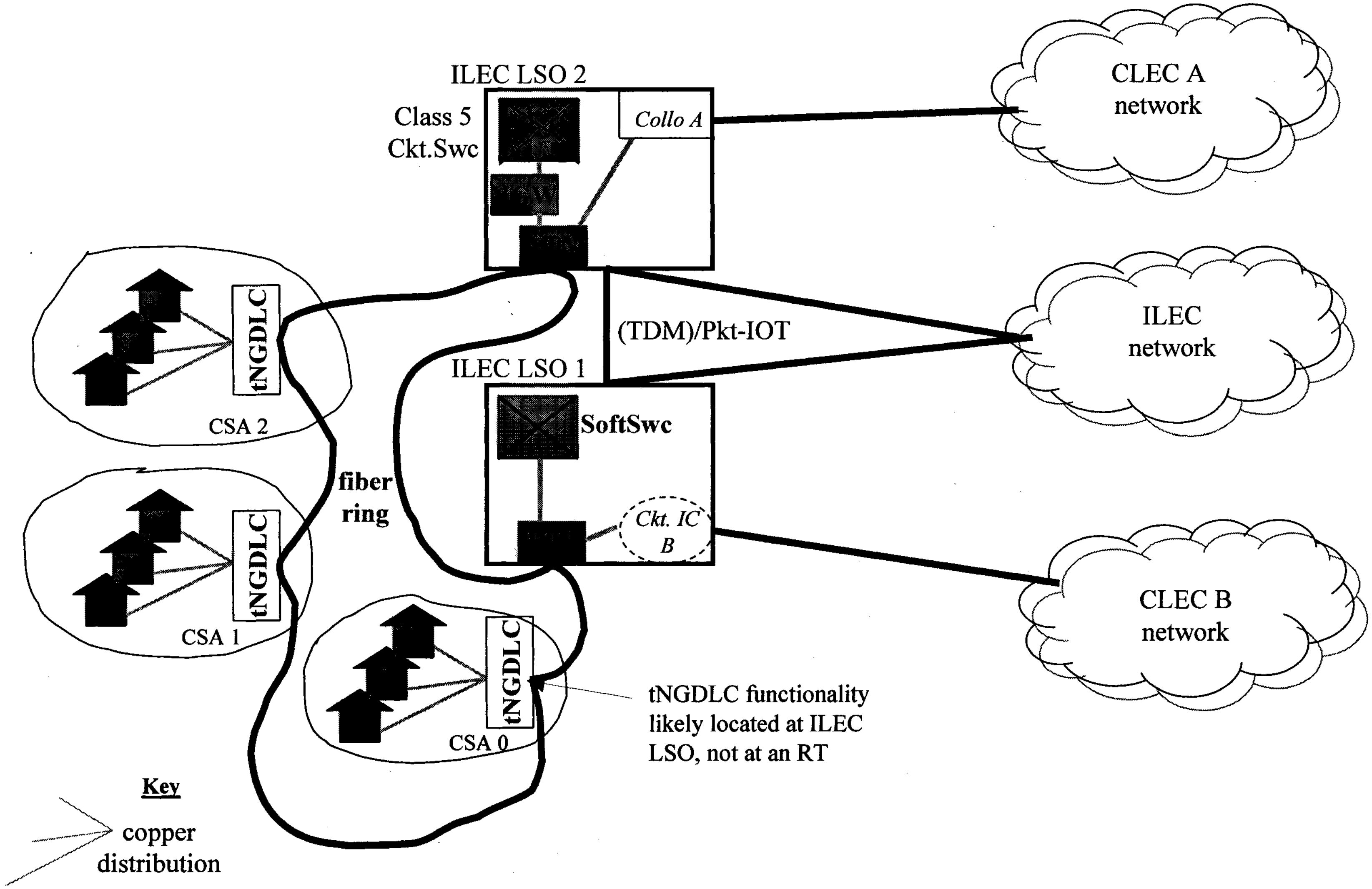
VP policing Allows the network elements themselves to enforce traffic contracts on a non-discriminatory basis. VBR services is the most efficient means to share feeder capacity.

VBR services Will guarantee a Sustained Cell Rate and will allow other VP connections to "borrow" bandwidth from other VP connections that are not fully utilized.

BASE ELP ARCHITECTURE



POSSIBLE ELP ENHANCEMENTS



ELP NON-ALTERNATIVES

GR-303 Unbundling

> **GR-303 is an unattractive technology for achieving the functionality of ELP**

> **GR-303 is inefficient and expensive for unbundling**
> -Only unbundles groups of lines, not individual lines
> -Inefficient and expensive use of interface groups by CLECs
> -Limits the number of groups therefore the number of CLECs that can have access
> -Limits CLECs to narrowband access only

> **Significant Technical Shortcomings Have Yet to Be Addressed**
> -Provisioning
> -Alarm reporting
> -Sharing of test resources
> -Software development

ELP NON-ALTERNATIVES

GR-303 Unbundling (continued)

> **ILEC such as Verizon have admitted that GR-303 unbundling is not a "cost-effective" solution and that "numerous operational and security issues" have yet to be resolved.**

> **GR-303 does not offer the benefits inherent under ELP.**

-GR-303 would not extend the reach of broadband and advanced services
-Does not promote converged networks but instead locks LECs to legacy networks
-Does not reduce CLEC collocation requirements

> **Non-GR-303 Solutions suffer similar shortcomings:**

> TR-08
> Hairpinning
> Cosmic frames
> Automated cross-connect devices, etc.

INVESTMENTS & COSTS

REQUIRED INVESTMENTS

>>> Measured for a forward-looking ELP network relative to current forward-looking network

>>> Current forward-looking network costed using UNE SynMod

> No change to NID/loop distribution investments because are based on <18 kft. of clean copper

> DLC investments adjusted to current GR-303 prices

> Feeder remains copper/fiber – no concentration and no daisy-chaining

> CO remains Class 5 circuit switch

> SONET ring / TDM interoffice transport

> SS7 signaling

REQUIRED INVESTMENTS

>>> Forward-looking basic ELP using UNE SynMod *(assuming DSL capability, but not actual DSL provisioning)*

> No change to NID/loop distribution investments
> Add tNGDLC investments on previous copper lines
> Substitute tNGDLC investments on previous fiber lines
> All feeders costed as fiber – no daisy-chaining
> Add ATM module and voice gateway at each CO
> CO remains Class 5 circuit switch
> SONET ring / TDM interoffice transport
> SS7 signaling

>>> Cost of incremental forward-looking investments varies based on extent of ELP upgrade (e.g., just switched lines or switched plus special lines), carrier universe (e.g., just RBOCs or all nonrural) and extent of ADSL penetration

ADDITIONAL ADSL INVESTMENTS

>>> Basic ELP cost per switched line is in the $113 range

>>> Added cost of actual ADSL provisioning to basic ELP:

- > Less than $150/line extra for ADSL/voice combo cards over voice-only cards
- > Modest increases in ATM capacity to support data throughputs in addition to voice
- > Cost of interoffice data network and ISP charges

	FL Cost for Basic ELP	FL Cost to add ADSL to Basic ELP
per switched line	~ $113	~ $150
FL cost to equip all RBOC switched lines	$17.4 B	$9.2 B
		@ 40% ADSL penetration

The extra expense required to upgrade existing embedded networks to ELP will depend on these networks' existing penetrations of fiber and modern DLC. It may be in the 25 to 50% range.

SHORT-RUN INVESTMENTS

>>> **Copper < 18 kft.**

> tNGDLC-inLSO, ATM and VGW

>>> **Copper > 18 kft.**

> Fiber feeder, tNGDLC-RT, ATM and VGW

>>> **UDLC**

> RT changeout to tNGDLC, ATM and VGW

>>> **IDLC**

> RT upgrade to tNGDLC, ATM and VGW

"COST"

ELP Capital Investment Cannot Be Viewed In Isolation

> **ILEC NGDLC** (e.g., SBC's Project Pronto, Verizon's PARTS) investments are similar to capital investment figures for ELP.

> **Hot Cut Expenditures.** Cost to migrate all ILEC switched access lines just once in their lifetime via hot-cuts could cost as much as ~$ 30 B.

> **Reduced Operations & Maintenance Expense.** Elimination of hot-cut process, reduced CO and OSP maintenance expense, reduced CLEC collocation requirements, etc. benefit both ILECs and CLECs

> **Economic Benefits.** Increased availability of advanced services, competition and innovation are good for end-users.

> **Economic Benefits.** Infrastructure investment spurs telecom industry and is a plus for the U.S. economy.

OTHER

LEGAL AUTHORITY

The Commission Has Authority to Require ILECs to Implement ELP

>>> **The Commission has historically exercised authority to impose market opening requirements ILECs :**
  > 1+ equal access needed to bring competition to direct dialed calls
  > 800 number portability to bring competition to toll-free calling
  > Virtual collocation requirements for CAPs

>>> **ELP requirements can be implemented gradually.**

>>> **ELP is one of the necessary prerequisites to de-listing ULS or transport (and UNE-P) for low volume locations.**

OSS

> Certain ILEC and CLEC OSSs will need to be enhanced to support ELP.

> Many of these enhancements will model enhancements that the ILECs already have made to support xDSL.

> Existing ILEC NGDLC architectures (e.g., SBC's Project Pronto and Verizon PARTS) already provision ATM PVCs (for data services only).

> Any network upgrade, whether it be for ELP or other purposes (e.g. FTTH architectures *aka* SBC BPON) will require OSS work.

> Flow-through provisioning allows for scale and minimizes end-user migrations costs, delays and errors through automation (e.g. analogous to LD PIC Process).

RBOC CRITIQUES

RBOC Assertion	Reality
AT&T's ELP Solution...	
...mandates a given broadband network architecture upon every ILEC.	> AT&T's proposal is one-way in which ELP can be achieved. > ELP establishes a standard loop interface for customer access to networks rather than mandating a particular broadband architecture > Loop architecture of ELP highly consistent with ILEC NGDLC architecture
...slows the migration to softswitch technology.	> ELP loops facilitate deployment of softswitch technology by delivering/receiving the communications in packet format. > ELP architecture facilitates investment in softswitches while not requiring replacement of circuit switches
...ignores non-ATM Technology.	> ATM & TDM are the proven transport technologies. > Ethernet is irrelevant unless copper loop lengths are shortened.
...ignores different flavors of DSL (e.g., SDSL, SHDSL) and would require a single DSL standard that would stifle innovation.	> ELP via tNGDLC Architecture does not foreclose any type of DSL. > Plug-in electronics will dictate DSL type. > DSL technology and interface standards are the product of collaboration by industry stakeholders including the LECs and equipment manufacturers
...ignores data transport that does not depend on DSL technology	> ELP addresses the simultaneous needs to address voice (POTS) competition and improve advanced service deployment to consumers. As such broadband dedicated data network services are not addressed. > Nothing in the ELP architecture adversely impacts the delivery of broadband transport services.

CONCLUSION

ELP Is Good For End-Users, CLECs and ILECs Alike

- ✓ End-Users
- ✓ Competition
- ✓ CLECs & ILECs
- ✓ Broadband & Advanced Services
- ✓ Local Network Infrastructure
- ✓ Telecommunications Industry / Market
- ✓ U.S. Economy